

PALLID STURGEON RECOVERY UPDATE

- the latest research and management actions for recovery -

November, 1993 No. 7

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The Pallid Sturgeon Recovery Plan was signed by the Regional Director for Region 6 of the Fish and Wildlife Service on November 8. All parties receiving this update will soon receive a copy of the final plan unless indicated otherwise during the recent survey included in the last Update issue. Contact: Mark Dryer, USFWS, Bismarck, ND (701)250-4491.

Recovery Team Makes Recommendations on Stocking

The Pallid Sturgeon Recovery Team has carefully evaluated proposed plans for stocking surplus pallid sturgeon progeny currently held at Blind Pony State Hatchery in Missouri. Due to data now available from electrophoretic and morphometric analyses that raise questions on broodstock purity, the Recovery Team has recommended that stocking not occur without further information on genetic implications of a stocking activity. Results on genetic analyses will be available this winter which will ensure a more informed decision.

Lower Yellowstone River Paddlefish

Reproduction Study.

Taken from the Larval Fish Newsletter, By Susan M. Hogard Bill Gardner reports that he has been sampling larval drift in the Yellowstone River for the past 3 years attempting to locate paddlefish spawning areas and investigate other aspects of paddlefish larval drift dynamics. The Yellowstone River is probably the best paddlefish spawning stream in the country. Thousands of mature paddlefish ascend this large free-flowing river each year to spawn and yet; very little is known about the reproductive life stage for this population. Results thus far have helped improve sampling methods. Bill reports that paddlefish larvae drift along the bottom of the channel and therefore nets should be positioned as close to the bottom as possible. He is also experimenting with net configuration (D-shape vs circular), diameter size of net mouth, and mesh size. Once specific spawning sites are determined and sampling methodology improved, Bill plans to evaluate whether larval drift can be used as an index for spawning success.

For the beginning years larval paddlefish catches were poor, averaging about 15 paddlefish larvae for the 2 month sampling period. However, over 50 paddlefish larvae were collected during 1992. This increase was attributed to improvements in methods.

Bill would like to hear from others involved with larval paddlefish investigations or who have ideas on sampling improvements. Contact: Bill Gardner, Montana Department of Fish, Wildlife and Parks, Fort Benton, MT 406-622-5108.

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Editor's note: Bill's work on larval paddlefish sampling will be applicable to larval sturgeon work. Bill has captured larval sturgeon during this study. Both sturgeon and paddlefish spawn about the same time of year in similar habitats.



Paddlefish

Culture and Propagation Studies are continuing. Gavins Point National Fish Hatchery (NFH) personnel along with personnel from the South Dakota Game, Fish and Parks Department captured two pallid sturgeon in Lake Sharpe, SD. These fish were transferred to Gavins Point NFH in Yankton, SD. The Service's Fish and Wildlife Management Assistance Office in Bismarck, ND, Pierre, SD, and Valentine, NE, joined forces and captured seven pallid sturgeon from the Missouri River in North Dakota the second week of September. Five of the pallid sturgeon were transferred to Gavins Point NFH. The remaining two were released after meristic data were taken. At least one of the sturgeon transferred to Gavins Point NFH is believed to be a gravid female. This brings the number of adult pallid sturgeon at the hatchery to 14. Gavins Point NFH will continue to hold, maintain, and develop techniques for culturing adult pallid sturgeon in 1994. Artificial fertilization may take place next spring. The objective would be to produce progeny for recovery-related research. Contact: Herb Bollig, Fish and Wildlife Service, Yankton, SD 605-665-3352, or Steve Krentz 701-250-4419, Fish and Wildlife Service, Bismarck, ND.

Growth, Rearing and Tagging Studies in North Dakota - In July 1993, 915 juvenile sturgeon produced at Blind Pony Hatchery, Missouri in 1992 were stocked in a broodstock pond at Garrison Dam NFH in North Dakota. The objectives of the study were to determine rearing and survivability requirements of juvenile

sturgeon in hatchery ponds and to document growth and development characteristics. These fish were intermittently weighed and measured with final measurements taken on September 24, 1993. A summary of the findings follows:

| | July 1 | August 9 | August 30 | Sept. 24 |
|------------------|--------|----------|-----------|----------|
| mean weight (g) | 47 | 107 | 104 | 111 |
| min. weight | 21 | 60 | 79 | 74 |
| max. weight | 71 | 125 | 136 | 142 |
| mean length (mm) | 245 | 325 | 309 | 309 |
| min. length | 203 | 279 | 229 | 250 |
| max. length | 275 | 356 | 343 | 340 |

Dissolved oxygen was also taken and this varied widely. The levels ranged from 0.5 ppm on August 13 to 10.5 ppm on August 28 with a mean of 6.5 ppm.

The sturgeon were also marked with an elastomer tag. Elastomer fish tags consist of a two component, liquid mixture which is injected into clear tissue of the fish. A fluorescent dye is added for visibility. When the two components are mixed, a reaction begins which hardens the materials into a firm, "rubbery" texture. Tags were injected under the skin on the ventral side of the pectoral fin. Any material left on the outside of the fish after injection was removed.

An antibiotic was also injected into two-thirds of the sturgeon. Recommended dosage was used on 300 sturgeon, one-half of this dose was used on 300 sturgeon, and 300 sturgeon were used as a control. Each group of fish was then injected with a different color of elastomer tag or at a different location.

A total of 230 pallid were checked for elastomer tags 86 days after they were tagged. The results are as follows: 82 (35.7%) were missing tags, 9 (3.9%) showed redness/infection around the area of injection, and 6 (2.6%) had unidentifiable tags.

Garrison Dam and Valley City NFHs are keeping 100 juvenile pallid sturgeon through the winter. Garrison Dam will be keeping theirs in an outdoor broodstock pond, while Valley City will be keeping theirs indoors. Morphometric and meristic measurements will be taken and

compared next spring to characterize development. Contact: Scott Elstad (701-250-4414) or Steve Krentz (701-250-4419), Fish and Wildlife Service, Bismarck, ND.

Sturgeon Studies on the Missouri River in Montana and North Dakota - The Montana Department of Game, Fish and Parks captured eight pallid sturgeon near the confluence of the Missouri and Yellowstone Rivers in mid-September. Four of these fish were recaptures and four were new fish. All fish were released immediately after meristic measurements were made. One pallid had been tagged in the Fort Peck tailrace in February 1991, 191 river miles upstream. This is the second pallid that has been recorded both in the Fort Peck tailrace and below the Yellowstone confluence. Two other recaptures were initially captured in October 1992 in the "pallid hole," a location on the Missouri River in North Dakota where many of the past pallid sturgeon have been captured. Both of these fish still had dangler tags. One PIT tag was not functional. The fourth recapture was first netted this past spring about 12 miles below the confluence. Radio and sonic transmitters attached last spring were no longer attached to the fish.

Radio transmitters were attached to the dorsal fins on 6 of the 8 pallids. Bob Bramblett, Doctoral Candidate, at Montana State University is monitoring movement of these fish and recording habitat use.

A study report that describes the results of a cooperative telemetry study has recently been completed. The goals of the study were to identify abundance, seasonal habitat use, migration patterns and potential spawning areas of pallid and shovelnose sturgeon and to evaluate pallid/shovelnose hybridization throughout the area. The study was jointly funded by the Army Corps of Engineers and the Montana Department of Fish, Wildlife and Parks. Contact: Anne Tews (406-526-3471) Montana Department of Fish, Wildlife and Parks.

Ecological Services in Bismarck, North Dakota, and Pierre, South Dakota, have continued

distributing free fishing rulers to bait/fishing license vendors in both states. The 12-inch plastic rulers inform anglers that pallid sturgeon are endangered and must be released. To obtain rulers for distribution contact Scott Elstad, USFWS, Bismarck, ND 701-250-4414.

Harmony with land is like harmony with a friend; you cannot cherish his right hand and chop off his left. That is to say, you cannot love game and hate predators.--- "The land is one organism."

Aldo Leopold

Tagging and Morphological Characteristics Study Continues - Biologists from Fish and Wildlife Service offices of Ecological Services and Fish and Wildlife Management Assistance in Bismarck travelled to Garrison Dam NFH in July, August, and September and to Gavins Point NFH in September to obtain morphometric and meristic data from juvenile sturgeon hybrids and juvenile pallid sturgeon spawned at Blind Pony Hatchery in 1992 and to evaluate various external and internal tags. The morphometric/meristic data still reveal character variations that make separation of the species and hybrids difficult at this age.

Four commercial tags were tested on retention and irritation to the sturgeon. Juvenile sturgeon were tagged in December 1992 and reexamined in September 1993. All were held in circular tanks or outside raceways at Gavins Point NFH. A summary of the tag retention results follows. Redness and tissue irritation was evident at points of attachment of most Hallprint tags. Hallprint tags are a dart-type tag inserted into the body cavity. Findings will be detailed in a report this winter.

| Tag | Retention Rate |
|----------------|------------------|
| Coded wire tag | 83% |
| AVID PIT tag | 94% |
| Floy tag | 46% |
| Hallprint tag | 91% |
| Fin punch | 100% recognition |

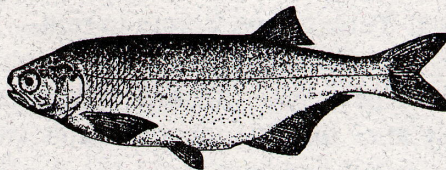
Contact: Mark Dryer, Scott Elstad (701-250-4491) or Steve Krentz (701-250-4419) Fish and Wildlife Service, Bismarck, ND.

Genetic analysis continues with DNA being isolated from blood samples of 190 pallid, shovelnose, and hybrid sturgeon. Segments of the DNA were amplified from sturgeon representing many different populations. Pallid sturgeon upstream of Ft. Peck and shovelnose sturgeon downstream of the Powder River were focused on because these populations would likely best represent the species, genetically.

Dr. Morizott plans to perfect the thermal profile and the reaction mixture in order to obtain a strong single band of amplified DNA. If a strong, single band is not consistently amplified using the above criteria, he will gel-purify the amplified DNA. Once this is finished, the DNA patterns will be compared between the pallid, shovelnose, and hybrid sturgeon.

Need for Known-Age Studies of Shovelnose Sturgeon. By Dave Buckmeier and Steve Kelsch A project to determine age of shovelnose sturgeon from the Missouri River in North Dakota was conducted during the spring of 1993 at the University of North Dakota. We (they) applied a variety of techniques to determine what was best suited for ageing the sturgeon. Two methods had the best potential for aging. One involved counting apparent annuli from a thin section of the marginal pectoral-fin ray. This method was established and validated for aging lake sturgeon and has been applied to shovelnose sturgeon. We (they) also found visible rings on lateral cross-sections of scutes. To validate these methods, we (they) compared ages determined using each method. Two problems led us (them) to determine that these methods were inadequate for

aging our (their) sample of shovelnose sturgeon. The numbers of apparent annuli on pectoral-fin rays and scutes did not coincide. Also, rings were laid down in bands of 1-3, leaving us (them)



Goldeye

uncertain as to whether annuli were denoted by each ring or each band. Based on our (their) study, we (they) believe that known-age studies are necessary before conclusions can be drawn about ages of shovelnose sturgeon from the Missouri River in North Dakota. For further information contact: Dr. Steve Kelsch, University of North Dakota, Grand Forks, ND 701-777-2621.

Incidental Catches of Sturgeon - Tracy Hill, a South Dakota State University student studying forage in Whitlock Bay in Lake Oahe, South Dakota, inadvertently caught a 600-700 mm sturgeon on September 25, 1993. However, the fish was released immediately with no meristic measurements taken.

Snagging Pallid Sturgeon - It was reported that 11 pallid sturgeon were landed in one day during the paddlefish snagging season in North Dakota, with approximately 18 confirmed "snaggings" throughout the season. The majority of these were caught in the Yellowstone River near Sundheim Park, approximately 9 miles upstream of the Missouri River. Two of these fish were observed by a U.S. Fish and Wildlife Service employee to be ripe spawners. The North Dakota Game and Fish Department and the Montana

Department of Fish, Wildlife and Parks are examining the effects of the paddlefish snagging season on pallid sturgeon.

Telemetry Study Below Ft. Peck in Montana -

Pallid sturgeon continue to be monitored by Bob Bramblett, Doctoral Candidate, at Montana State University. Earlier this summer, he reported most pallids were in the lower nine miles of the Yellowstone River, and all pallids tagged in the Yellowstone vicinity were up the Yellowstone River. A pallid caught in June 1992 just above the confluence was tagged and located 40 miles downstream. Between July 1992 and April 1993, it moved upstream of its original tagging site. Another pallid fitted with a transmitter at Intake, Montana, travelled downstream 100 miles and back up to Intake within 5 weeks of being tagged. Now Bob reports that most pallids are in the Missouri River within 5 miles downstream of the Yellowstone River confluence. One is in the first mile of the Yellowstone River and one is downstream 30 river miles near Williston, ND. Movements by the pallids are usually about 3-4 miles per week. Monitoring of movement will continue through the middle of November. Contact: Bob Bramblett, Bozeman, MT 406-994-3698.

The Inland Fish Division of the Louisiana Department of Wildlife and Fisheries (LADWF) has been sampling near the Old River Control Structure at the Mississippi River diversion to the Atchafalaya River. They have found that length frequency distributions made from hybrid pallid/shovelnose sturgeon seem to fit very nicely between those made strictly from pallid and shovelnose sturgeon. A total of 137 sturgeons were examined in the catches of commercial fishermen. These included 106 shovelnose sturgeon, 17 pallid/shovelnose hybrids, and 13 pallid sturgeon. Additionally, non-lethal methods were employed to obtain 40 tissue samples from sturgeon (20 shovelnose, 10 from pallid/shovelnose hybrids, and 10 from pallid sturgeon) for genetic analysis studies. Contact: Bobby Reed, Louisiana Department of Wildlife and Fisheries, Lake Charles, LA 318-491-2577.

Morphological Development and Identification studies of pallid, shovelnose, and hybrid sturgeon larvae are continuing. Dr. Darrel Snyder, Colorado State University, has finished five complete illustrations for each species representing 9, 12, 14, 16, and 19 mm TL specimens and one illustration for the hybrid representing 12 mm TL specimens. Morphological, morphometric, meristic, and developmental-state-relative-to-size analyses have been delayed but will be completed shortly. Contact: Dr. Darrel E. Snyder Larval Fish Laboratory, Fort Collins, CO 303-491-5295.

Russian Sturgeon Symposium - As reported in the last update, Dr. Kent Keenlyne presented a paper at the "Second International Symposium on the Sturgeon" on September 6-11, 1993. Dr. Keenlyne left on September 1, and had 3 days of cultural exchange prior to the meeting.



Sickleafin Chub

The symposium took place on a 5 deck, 400-foot long ship with 120 participants, eight from the United States. This ship travelled 500 miles on the Moscow ship canal and the Volga River. Dr. Keenlyne related that there were many interesting papers, with participants from 16 countries in attendance. Academic, State, and Federal agencies were represented.

One of the main objectives Dr. Keenlyne had was to obtain information on cryopreservation techniques of sturgeon. He did contact a Russian scientist that has been freezing four species of sturgeon sperm. This scientist has also tried freezing fertilized eggs, with little success.

Russians have many fish farms with sturgeon hybrids and felt very strongly that these fish do have a niche in our world. They also did not understand the problem we have over the hybrid or pure strain pallid sturgeon. There is, however, a growing segment of the Russian scientific community voicing their concerns about releasing hybrids into the wild and the dangers of backcrossing, introgressive hybridization, and the subsequent destroying of the wild, pure genetic stock.

Contaminants in sturgeon were also discussed, particularly the variations in concentrations in the different tissues of sturgeon. Significant differences in concentration levels in different tissues were found in the same sturgeon. This was particularly true in reproductive tissues and in lipids.

Dr. Keenlyne made the observation that the majority of research concerning sturgeon in the United States was centered around life history, while in Russia it was aquaculture and artificial propagation.

The Russians are now raising paddlefish. These fish were obtained from Missouri in 1974. They now have an excellent broodstock population established and paddlefish have become a "hot" commodity. The Russians are now even shipping paddlefish fry all over Europe. There are also a few concerns about paddlefish ruining the caviar industry in Russia. It was also clear that paddlefish stocks throughout the world are in serious trouble - especially the anadromous ones. The lack of environmental controls and unrestricted commercial catches were thought to be major contributing factors to the declines.

The next International Symposium on Sturgeon is tentatively scheduled to be held in Italy in 1996. The second choice site is the United States. This symposium is to be primarily centered on aquaculture techniques.

Dr. Keenlyne also has two articles that will be published in the near future. The first one is "Age of Sexual Maturity of Pallid Sturgeon" and

will be in Transactions of the American Fisheries Society. The second "Formula for Length Conversion for the Lengths of Pallid Sturgeon" is co-authored with Steve Maxwell and will be found in the South Dakota Academy of Sciences. For more information contact: Dr. Kent Keenlyne, USFWS, Pierre, SD 605-224-8693.

Pallid Sturgeon Telemetry Studies are continuing in the outflow channel of the Old River Control Structure in the Mississippi and Atchafalaya Rivers of Louisiana. In October, 200 sturgeon captured by commercial fishermen were handled. Twenty-eight were identified as pallid sturgeon and three of these were gravid females. Transmitters were implanted into four more pallids, bringing the total pallids tagged to eleven. There was also a pallid/shovelnose hybrid implanted with a ultrasonic transmitter (not included in the eleven fish total).

Telemetry activity has been somewhat more successful than anticipated, as relocation of pallid sturgeon during periods of high water is possible. Initially, it was thought that this would be a problem due to the high sediment load of the Mississippi and Red Rivers. Contact: Glenn Constant 504-388-4177, Baton Rouge, LA, or Larry Hartzog 504-862-2524.

Share what you are doing for sturgeon conservation on the Missouri and Mississippi Rivers with other sturgeon researchers. Submissions of sturgeon articles and associated materials are welcome. Please send a hardcopy and/or disk copy (WP 5.1) to Mark Dryer at the U.S. Fish and Wildlife Service, 1500 Capitol Ave., Bismarck, ND 58501 (701-250-4491).

A Montana - North Dakota Pallid Sturgeon Recovery Work Group was recently organized and met September 23, 1993, in Bozeman, MT. Formation of regional, recovery work groups is a recovery task identified in the pallid sturgeon recovery plan. The group will focus their efforts on pallid sturgeon upstream of Lake Sakakawea in the Missouri and Yellowstone Rivers and on the Missouri River downstream of Garrison Dam to Lake Oahe.

The purpose of the work group will be to serve as an advisor to the Fish and Wildlife Service (including the Pallid Sturgeon Recovery Team) and other affected entities having management and research responsibility for the pallid sturgeon in Montana and North Dakota. The primary goal of the group would be to facilitate implementation of recovery actions that will allow downlisting or de-listing of the pallid sturgeon in Montana and North Dakota.

It was decided that a facilitated workshop would be held in Billings, MT, sometime in early December. Pallid sturgeon researchers in Montana and North Dakota will be invited along with three researchers from outside the basin. The goals of the meeting are to develop research needs, determine feasibility, and develop study plans. Contact: Chris Hunter, MTDFWP, Helena, MT 406-444-3183 or Mark Dryer, USFWS, Bismarck, ND 701-250-4491.

Status Reports on Sicklefin and Sturgeon Chub have now been completed. A draft population status report on the blue sucker has also been completed. For copies of the reports contact: Scott Elstad 701-250-4414, USFWS, Bismarck, ND.

Catch Record Database Updated - Fish and Wildlife Service biologists in Bismarck updated the pallid sturgeon rangewide catch record database, which is now current through September 1993. There have been 37 reported catches of pallid sturgeon in 1993, seven of which were recaptures and one was a possible hybrid. The report includes records of capture for over 600 pallid sturgeon from as early as 1920. Only scant information is available for the earlier records, most coming from commercial fishermen. Recent catch records by fishery researchers and managers provide information on morphological characteristics of the individual fish and habitat characteristics at capture locations. Contact: Mark Dryer, Ecological Services, Bismarck, 701-250-4491.

Pallid Sturgeon Recovery Video Approved - A proposed video for television with a proposed title

of "Recovering the Weird and Wonderful Pallid Sturgeon" was recently approved for development by the Fish and Wildlife Service Public Affairs Office of Region 6. This video will present information on the pallid sturgeon, causes for species decline, actions needed for recovery, and recovery benefits to the public. Support for recovery efforts will be needed from the public for acceptance of recovery actions that will result in economic impacts. The production of this video was identified as an action item (priority 1) in the draft pallid sturgeon recovery plan. Cost for the video is estimated at between \$50-\$60,000. Funding sources and opportunities are being pursued. Contact: Mark Dryer, USFWS, Bismarck, ND (701)250-4491.

Pallid Sturgeon Recovery Team Members

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Dr. Phil Stewart, Montana Department of Fish, Wildlife and Parks, Miles City, MT

James Riis, South Dakota Game, Fish and Parks Department, Pierre, SD

Kim Graham, Missouri Department of Conservation, Columbia, MO

Bobby Reed, Louisiana Department of Wildlife and Fisheries, Lake Charles, LA

Dr. Frank Chapman, University of Florida, Gainesville, FL

Dr. Kent Keenlyne (Consultant), USFWS, Fish and Wildlife Assistance Office, Pierre, SD



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